The SHE project: Sustainable Housing in Europe. Social housing coops' best practices for sustainable communities

Alain Lusardi and Arianna Braccioni

Federabitazione Europe, Confcooperative, Rome, Italy

ABSTRACT: The pressure to set out strategies for sustainable building to reduce CO_2 emissions and energy consumption is increasing. The social housing cooperatives, managers of a large segment of the housing stock and expression of inhabitants' needs, are important actors for sustainability. This area has been largely ignored in current development activities that often do not follow an integrated and people centred approach.
This paper presents the first results of an ongoing EU co-funded project, where social housing cooperatives have partnered with scientific and technical organisations to demonstrate the feasibility of sustainable housing on a daily practice.
The 8 case studies in Denmark, France, Italy and Portugal illustrate the potential and the obstacles of applying sustainable solutions.
The main project outcomes are:
-Recommendations for social housing organisations clarifying the responsibilities of all participants involved and the procedures for the management and design process;
- A dwelling manual for each SHE pilot project for reinforcing environmental awareness of inhabitants in the use and maintenance of the dwellings;
- A global life cycle cost methodology, for highlighting social and economical advantages of sustainable housing.

Keywords: sustainable housing, social housing cooperatives, energy saving, saving of natural resources

1. INTRODUCTION

SHE "Sustainable Housing in Europe" is a five-year European demonstration project funded within the 5th FP – Energy, Environment and Sustainable Development, Key Action 4 – Cities of the Future and Cultural Heritage (2003 – 2008). It aims, as the main objective, to send a clear message to all urban stakeholders and citizens that today moving towards an everyday practice of sustainability in newer housing estates, involving all stakeholders and especially the final users in the building process, is possible and necessary. The SHE commitment is to demonstrate that the application of basic sustainable principles in the daily practice is not a utopia of the next millennium, but a commitment that should be attended by everybody and that is worthwhile to everybody.

At the end of the project, thanks to the continuous involvement and interaction of different stakeholders (housing providers, professionals, universities, public bodies, etc.), sustainable dwellings for about 600 families will be designed, built and monitored in Italy, Denmark, France and Portugal (Figure 1). The new methodology and the guidelines developed by the SHE consortium will demonstrate the replicability of sustainable housing sites with different climate and conditions, reflecting the different realities of the European Union.

Since 2003, eight social housing organisations together with a team of well-experienced experts, coordinated by the Federabitazione Europe (Italian housing co-operatives federation), have been working to develop an integrated approach on new urban areas, promoting the inclusion of sustainable urban management on political agenda and policies at national, regional and local levels in 4 countries.

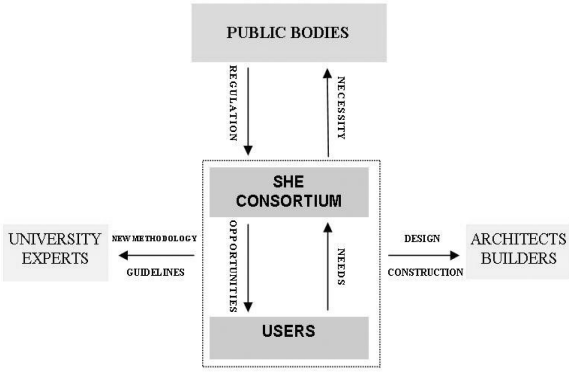


Figure 1: The SHE integrated approach

The SHE project is innovative not because of new products or technologies, but because of its methodology and aim. The involvement of cooperatives, end-users, designers, public bodies, producers, etc. from the beginning of the project, is the most important means for moving towards a common practice of sustainable housing.

The idea is not to set very high standards for the dwellings that would only be applied by a minority, but to define minimum standards, with good levels of energy and water savings and with affordable costs that can be adopted by everybody.

There is already an important number of technologies, systems and materials for sustainable building projects but the real problem is to introduce them into the common practice, taking into account the social and environmental conditions of the building site and activating a cultural process for involving and convincing all the stakeholders of the necessity of a sustainable built environment.

2. THE SHE APPROACH

The SHE project provides scientific support to each main subject a scientific advisory. A team of experts supplies the necessary indications to implement sustainability in each of the pilot projects. The topics of interest, the so called Horizontal Activities, are of great importance for the publication of the new methodology and guidelines.

2.1 Participation Process

The participation process is an essential part of sustainable construction projects' management. It consists in the whole range of actions aiming at making the different stakeholders take part and/or influence the decision making process.

The participation process includes different types of actions with different interaction and influence levels: from the information to the cooperation level. The level and intensity of participatory actions and their concrete influence on the decisions represent a significant indicator of the projects' social sustainability level.

The process of participation implies the set up of a dialogue between the different stakeholders since the project writing phase. The dialogue fosters the implementation of higher quality projects responding to both end-users' needs and expectations as well as to the community's interests. It also contributes to the end-users' change of behaviour.

The dialogue with the future end-users helps achieving optimal use and long term performance as well as an appropriate management of the buildings.

2.9 Social and economic aspects

Sustainability is a shared responsibility. Co-operation and partnership with different level organizations are crucial.

The objective is to structure and organise a common platform to carry out inquires for evaluating the values and attitude of the tenants towards the environmental issues. For each pilot project a specific model, the SET SHE (Sustainable Economic Tool) model, regarding the shared global cost for each project and for different types of actors, will be developed.

This innovative Life Cycle Cost tool, based on the OLCC (Overall Life Cycle Cost) approach is a crucial tool for evaluating the importance of sustainable housing benefits and to convince the national and local governments to provide incentives for sustainable housing based on its social and economical advantages. It includes externalities and induced impacts making the project "shared" between different actors. *Externalities* include environmental and social impacts, which do not have a market value. *Induced impacts* regard the indirect impact of a project.

The objective is to work out and apply a new specific methodology using both economic and social impacts as assessment tools.

2.2 Site Analysis, building and landscape design

The principal aim of a site analysis is to highlight a design method to guide the eco-sustainable design process of the different SHE projects. It represents the first essential step which provides basic information to define project sustainable targets. From the site analysis it is possible to get a clear overview of the existing situation in which the project stands, both in terms of potentialities offered by the site and problems to solve (even looking to the neighbourhood scale).

The macro activities that should be performed by each design team are the site analyses, the definition of specific design targets and the selection and control of the different solutions.

2.3 LCA procedures, safe materials and technologies

The principal aim is to provide guidelines and recommendations concerning the choice of sustainable building materials, components and maintenance or finishing products.

The guidelines are provided to enable design teams to orient their choices and clearly focus on the problems, considering that, in a sustainable approach, materials have to be evaluated comprehensively, taking into account the implications related to their overall life cycle: from the production to the dismissing.

2.4 Water, ground and underground management cycle

The aim is to achieve large reduction on the water consumption by using well-known techniques, materials and components without minimizing the comfort of the housings noticeably.

The purpose is also to limit the interference in the natural water cycle as much as possible. In practice, this takes place partly by limiting the quantity of water, which is pumped for consumption, partly by retransferring the optimum quantity of rainwater to the water cycle.

2.5 Waste management cycle

These recommendations explain how to "prevent separate and recycle" waste in connection with the construction and management of a building.

Construction waste emerges the year in which the housings are built, whereas the household waste arises for the next 100 years during the operation of the housings. In this Horizontal Activity, the focus is on the construction waste, whereas the user manuals of the dwellings will explain how to prevent, separate and recycle the household waste.

2.6 Energy management cycle

The main objective is to reduce CO_2 emissions. For each demonstration project the eco-management for energy is encouraged. The guidelines are meant to develop and finalise ventilation and heating system designs, to explore the feasibility of mixed mode or natural ventilation approach, to consider thermal storage options, to select exterior wall systems and insulation appropriate for the local climate, to reduce the needs for cooling using passive cooling systems and to use active and passive solar systems.

Important preliminary targets for energy performances have been set and the simulations done have shown that the targets have been surpasses by many of the SHE pilot projects.

2.7 Day-lighting and acoustic issues

The objective of this topic is the satisfaction of visual and acoustic comfort requirements inside the buildings. It is important to promote day lighting instead of artificial lighting, sun shading devices, correct fenestration and the use of innovative solutions and special materials for day lighting applications.

Specific information has been provided for the noise control, both at neighbourhood and building scale, through careful planning of the building.

2.8 Energy and environmental simulation and monitoring

The main objective of simulation and monitoring is to measure and quantify the actual performance of the buildings, comparing it with the theoretical expectations based of the strategies adopted in each project.

The information gathered through the monitoring activities will be used to examine the efficiency of the different choices adopted in the planning phase, and to increase the know-how and the awareness of the cooperatives regarding the use of innovative tools to be applied in future projects.

To conclude, it is important to note the difficulty in synthesizing and simplifying some complex Horizontal Activities topics into practical documents. The scientific partners and social housing organisations have therefore discussed how to transfer the original recommendations into recommendations that are more feasible. As our challenge is "moving from extraordinary to the ordinary", we have tried to avoid unrealistic targets and documents that are too long or academic and therefore not practical tools for housing organisations.

The SHE book will contain an introduction, a presentation of the pilot projects, conclusions (lessons learnt) and a discussion on financing. The pilot projects will be more thoroughly presented in appendices. The SHE book will also explain the holistic approach of the SHE project and the interlinkages of the horizontal activities as well as the different topics.

Especially, the SHE book will contain an integrated roadmap with practical recommendations aimed at supporting social housing organisation to introduce sustainability in future projects and to clarify the responsibilities of all participants involved and the design and administrative procedures to be followed in the project management and design process. This document is a useful and vital resource in advancing social housing organizations' adoption and daily practice of sustainable building principles.

NATURAL RESOURCES SAVINGS (an average of the 8 pilot projects)		
	Target	Simulation results
Energy saving for heating	30 %	40 %
Energy saving for cooling	100 %	100%
Energy saving for lighting	20 %	20%
Water savings in the building, including rain water recover	40 %	40%
Reduction of the use of primary raw materials	25 %	30%
Reduction of construction related waste	45 %	60%
Recycling of urban waste during the use of the buildings	35 %	35%
Reduction of the best practice life cost of the construction process	65 %	55%

Table 1: Targets set up for saving natural resources and results of the simulations (compared with local regulations or with current practices)

3. THE IMPORTANCE OF COMMUNICATION

Great attention has been given to the dissemination and convincement activities which have been carried out according to the SHE principle that dissemination is not only for spreading information, but for involving and convincing, and the results have been very satisfactory.

The SHE consortium has been engaged in activities to create a broader consensus on sustainable housing and to stimulate the participation of the policy- and decision-makers and main actors of

urban management. More levels of communication were used in order to create a new vision towards sustainable urban development in all these urban actors and to prepare the ground for acceptance of the concepts of this new vision.

At all the events, there was an increased interest in sustainability topics and high expectations from representatives of various national stakeholders, including policy-makers, to receive support and advice for future planning initiatives, to work with experts in order to explore the development of a sustainable procedure, to define and test a "code of good practice", to manage sustainability throughout the principal stages of the decision-making process during the land planning use and building construction, and to discuss how to develop examples of a sustainable urban development which take into account social aspects and participation during the whole process.

The social housing organisations are strategic actors for realizing urban sustainable development and therefore their effective commitment contribute to the change of urban planning management. Many municipal land planners have understood that there exists a bottom-up demand and that citizens ask more and more to live in a sustainable neighbourhood. The importance given to the bottom-up demand is inherent in the cooperative movement in many countries as for example in Italy.

The specific aims of the SHE dissemination activity are:

-To provide interactive and targeted information about the project, putting in evidence all the relevant features, the problems encountered and the measures defined in order to overcome them;

-To ensure a widespread dissemination of knowledge. Adoption and exploitation of the successful approaches and techniques used in the SHE project also by the current networks of the social housing organisations;

-To enable key decision-makers in social housing development to adopt these approaches and techniques;

-To disseminate relevant results to the new member states of the EU through a major European organisation of social housing.

-To spread the results to the different stakeholders involved through distribution of newsletters, booklet, press releases, book, mobile exhibition, etc;

-To publish and update the web site: www.she.coop

4. THE SHE PILOT PROJECTS

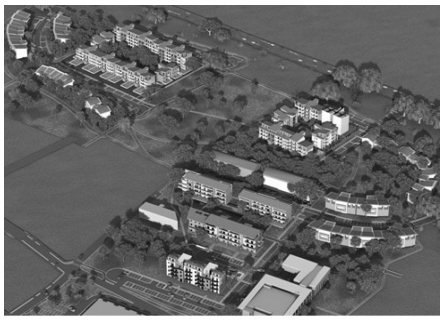
According to the SHE approach explained above, the demonstration projects are now under construction or already built.

Each of the 8 pilot projects (Fig. 2) provides concrete examples of integration of sustainability by means of long-term management of land, water, waste, energy and natural resources in social housing and of integrating close participation of citizens in the decision-making phases of urban management.

Figure 2: the 8 SHE pilot projects

4.1 The Italian pilot projects

The Preganziol project – Treviso **Social Housing organization: COIPES**		70 eco-dwellings
Design team: Studio Memar, Esmaillou, Giacomini, Marinelli Project responsible: Matteo Pilotto		
Construction	November 2005	March 2007



The Villa Fastiggi project – Pesaro **Social Housing organization: COPES**		130 eco-dwellings
Design team: Mingozzi, Bughi, Fabbri, Chella, Bottiglioni, Proni, Medola, Bodini e Polistudio Project responsible: Piero Mei		
Construction	November 2005	May 2007

The Mazzano project – Brescia **Social Housing organization: CONSEDI**		40 eco-dwellings
Design team: Rosoli, Gaffuri, Doninelli, Albasi, Ziliani, Zola, Trivelli Project responsible: Mario Rubagotti		
Construction	May 2006	December 2007

The Ozzano project – Bologna **Social Housing organization: COPALC**		12 eco-dwellings
Design team: Silvagni, Giovannini, Porelli, Tugnoli Project responsible: Stefano Matteucci		
Construction	May 2005	December 2006

The Teramo project – Teramo **Social Housing organization: CCICASA**		60 eco-dwellings
Design team: Stirpe, Figliola, Torrieri, Farina Project responsible: Corrado De Iuliis		
Construction	April 2006	September 2007

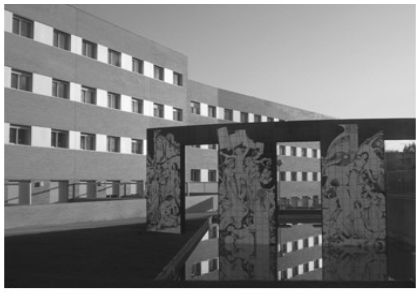
4.2 The Danish pilot project

The Lystrup project – Aarhus Social Housing organization: RINGGAARDEN		130 eco-dwellings
Design team: Thomas Herzog & partner, D Project responsible: Palle Jorgensen		
Construction	January 2007	November 2007

4.3 The French pilot project

The Burgoin-Jallieu project– Grenoble Social Housing organization: OPAC38		61 eco-dwellings
Design team: Sidler, Groupe 6, ADRET, GTG Project responsible: Michel Gibert		
Construction	March 2003	March 2004

4.4 The Portuguese pilot project



The Matosinhos project– Porto Social Housing organization: NORBICETA		101 eco-dwellings
Design team: Coelho, Sousa, Teixeira, Azevedo Project responsible: José Coimbra		
Construction	December 2004	February 2007

5. REPLICATION POTENTIAL AND FIRST IMPACTS

The replication potential of SHE is very high and the first results and impacts on the building sector and social housing practices are already visible.

The SHE project has contributed to boost keys stakeholders to understand that it is time for action, and the social housing movement has demonstrated that cooperatives are almost a perfect means for understanding what sustainable living is and how it is possible to change behaviors and attitudes. Social housing providers are considered as key actors for the generation of dynamic partnerships, linking the creativity and intensity of a wide range of actors.

The SHE partners have recently promoted in each country professional training, dissemination and training actions for informing the managers of the housing coops and the end-users about the use of renewable energies, bioclimatic approaches, ecological materials, etc.

In Italy, Federabitazione has created an innovative network of social housing coops for providing practical energy and environmental recommendations and quality procedures for the building process (design, construction, use and maintenance).

In France, OPAC38's board decided to develop its own Agenda 21 for promoting the inclusion of the sustainable concept in the daily practice of OPAC38.

Similar results have been reached in Portugal and Denmark and it is important to note that the SHE buildings have managed to create a growing interest of the professional actors: architects and students are visiting the construction sites, asking for details on the technical and non-technical issues of the project, writing graduation thesis on the new trend of sustainable architecture and the SHE approach. Delegations from many countries have come to Italy to visit the building sites including delegations from Singapore, Poland and Australia.

The SHE project is a great inspiration for other housing associations, private, municipal and international organizations and was presented at the United Nations HABITAT meeting of Nanning (China) as one of the best European projects on urban sustainable development.

In the municipalities where the pilot projects are situated there is a “domino effect”: more and more the local actors ask the SHE partners to be engaged in new housing projects or to give advice to reinforce professional skills, impose high demands for the energy and environmental quality in housing projects.

In February 2007 the SHE project was awarded with the prize of the Sustainable Energy Europe Campaign 2005-2008 (Fig. 3) – A European Campaign to raise awareness and change the landscape of energy (www.sustenergy.org). This is an important recognition and also confirms the key role of social housing in raising the awareness of decision-makers at local, national and European level, spreading best-practice, ensuring a strong level of public awareness and stimulating the growth of private investments in sustainable technologies.

SHE won the category “public-private partnership” with the following motivation of the Jury:

“SHE represents a shining example of a public-private partnership were social housing cooperatives on a local, regional and European level have partnered with building companies, scientific institutions and technical organizations to demonstrate the feasibility of sustainable housing and communities.
SHE focuses on raising awareness among end-users and wants to improve the lives of citizens by offering healthy and sustainable environments. The partnership is demonstrating an integrated approach to the development and construction of sustainable housing by making the extraordinary ordinary. By the end of the project, 600 families in Denmark, France, Italy, Portugal will be living in sustainable dwellings. SHE will develop best-practices guidelines so that sustainable dwellings can be replicated by others.”

Figure 3: SHE awarded with the Sustainable Energy Campaign Prize of the European Commission

7. CONCLUSION

The SHE team has put a big pressure on the key stakeholders and the activities carried out have not been limited in time or place. The actions have generated further progress and achievements both for the projects and for the local and national policy.

The social housing cooperatives have demonstrated to be a perfect means for raising the awareness towards sustainable living and healthy lifestyles. They are also key actors for dynamic partnerships, linking the creativity of a wide range of actors, injecting energy into the national dialogue.

At the beginning of the SHE project, in 2003, the decision to make an effort to lower the major barriers was a big challenge. In all the countries involved, the efforts of the national governments were almost inexistent or fragmented, the process of mainstreaming sustainable practices was very slow and the key EU documents, as the Thematic Strategy on the Urban Environment or Energy Performance of Buildings Directive, were not published yet. In light of this, it is easy to understand that the SHE philosophy was considered a very long-term vision, or even an illusion of some utopist cooperators.

However, in the last years, due to the increased focus on climate change, natural resources and energy prices, we have experienced a strong increase of interest. New technical knowledge, products, projects and local regulations are coming out and actors of the building sector are realizing that they can actually have an impact.

The different SHE teams have acted as critical friends with the local governments and as ambassadors for sustainable housing development and have contributed to go from a “non-culture” to a culture of sustainability.